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Aloe ausana in the Poindexter collection



CACTUS AND SUCCULENT JOURNAL

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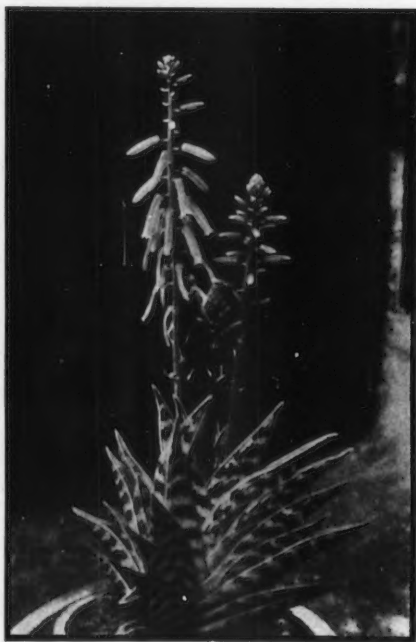
ALOE AUSANA

(See front cover)

R. W. POINDEXTER

Among the small aloes, the choicest and most aristocratic is one which has recently appeared in our midst: *Aloe ausana*. There are several species of succulents in genera other than *Aloe* which also bear the name *ausana*. Judging from this, the town of Aus must be the center of a good collecting ground. It is in Namaqualand, in the southern section of Africa, in a mountain range about 50 miles inland from the west coast.

Aloe ausana, while obviously a close relative of *A. variegata*, has several points of superiority over that species. It is decidedly more compact and chunky; the leaves, which are very thick, are so short that they form equilateral triangles themselves in addition to forming a plant which is triangular. The ground color is darker, furnishing a more striking contrast to the white markings and the wider white marginal bands. Best of all, it is decidedly easier to grow and keep in prime condition. Its rate of growth is slow, but that is an advantage in a collector's plant. Although its flowers look like pink coral, this is one of the few Aloes that I prefer out of bloom. Its geometrical symmetry is ornament enough.

*Aloe variegata*

Farmyard at Omatlin with *Echeveria elegans*

Collecting Succulents in Mexico

By ERIC WALTHER
Part III

All photographs by Author

Before ending this series with a resumé of our general conclusions, our experiences on at least two more excursions may be worth recounting. The identity of at least one species of *Echeveria* in particular has long been puzzling us. Said by Dr. Rose to be one of the showiest of all *Echeverias*, *E. subrigida* (Robins & Seat.) Rose had never been definitely recognized in any of our cultivated plants, even if the name had been applied at various times to a number of items as *E. lozani* Rose, for instance. Examination of the type-specimen in the Gray Herbarium at Cambridge, Mass., still left us uncertain, so that a visit to the type-locality of this species was one of the important goals of our Mexican trip.

Proceeding to Toluca by "Tourismo" over a most excellent asphalt-paved highway, we saved an hour's ride on the slower train, which time Mr. Otis McAllister, my guide for

the trip, and myself utilized in making arrangements for the next day. Continuing by train, we disembarked at Solis, the first stop beyond Tultenango Canon, returning towards Tultenango on foot. Approaching the Canon proper from the north, one faces a long line of steep cliffs, volcanic in nature (see photo B3) through which a stream has eroded the Canon. The railroad tracks, our only trail, brought us to the base of these cliffs, on the upper rim of which we soon spied our first plants of *E. subrigida*, just through flowering. The species is really a most showy one, the silver-white leaves most effectively set off by intense red margins. Nothing just like this was known to us from cultivation, except perhaps some very small seedlings just germinated. Celebrating our discovery of the first plant (see photo B4) we took numerous photographs following a lunch of cold chicken, etc. We later con-

tinued through the Canon proper, finding numerous additional plants of this *Echeveria*, as well as several examples of *E. byrnesii* Rose. This grass-green species frequents shadier, moister spots than its congener, and flowers in the spring. At the rim of this Canon nestled *Echinofossulocactus multico-status*, quite happy here, and seemingly unconcerned over the terrible name fastened upon it, almost longer than the plants. Rain threatened, and the return-train being due, we hastened back to the station of Tultenango, which is really closer to the Canon than Solis, returning thence to Toluca there to spend a rather chilly night.

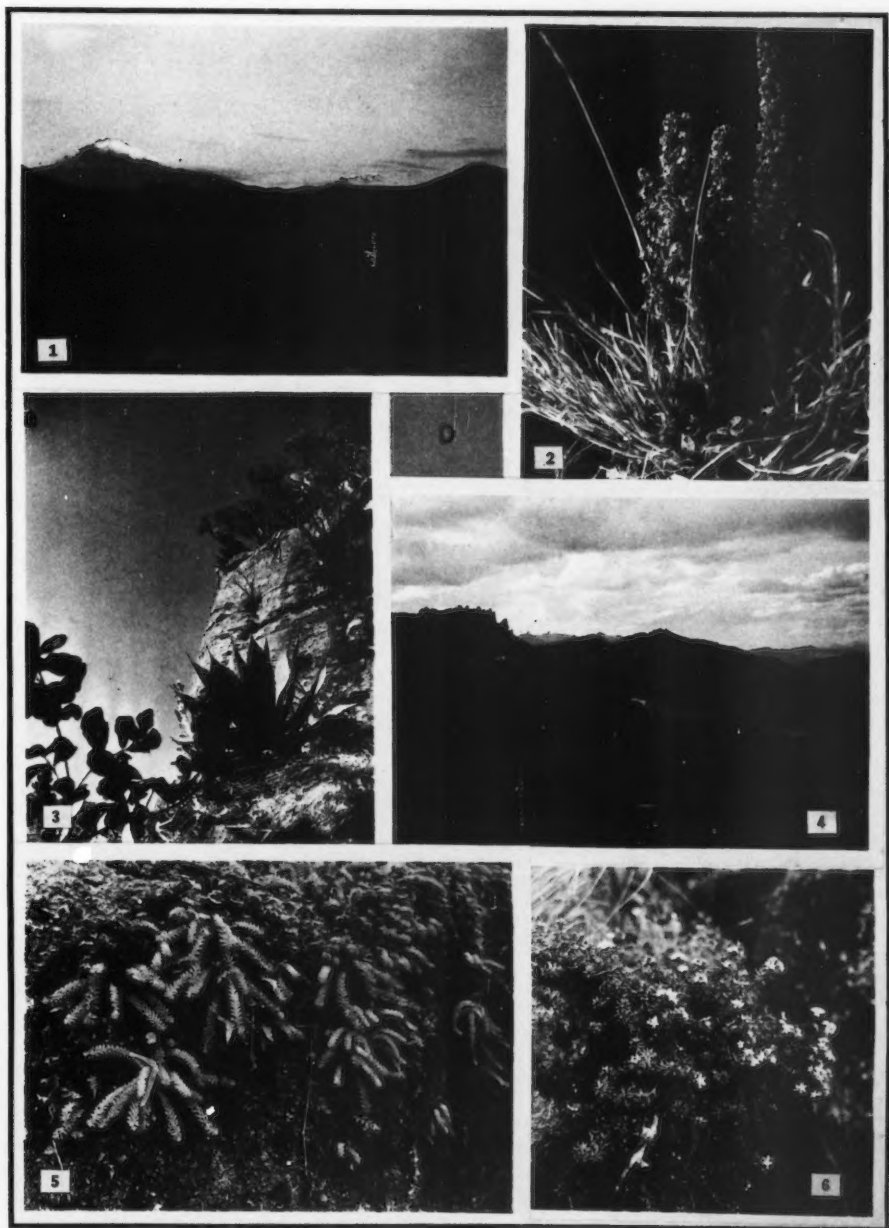
Early next morning we set out for the Cerro de Teresano, said to be the home of *Echeveria toluensis* Rose. Seen growing the day before in a square, called "Jardin de Zaragossa," the gardener in charge had furnished us with a muchacho for guide who knew the locality well, actually having been born at the foot of the hill. In what practically was the front-yard of his home we were surprised by finding hundreds of plants, in full bloom, of *E. grandifolia*. These furnished a striking spectacle with their array of tall flower-panicles; rather unexpected in view of the chilly climate and the doubtful hardiness of the species in our California gardens. *E. toluensis* was soon found, but it is rather scarce, due, we were told, to the habit of local gardeners of carrying it off by the sackful.

Later this same day we chartered a taxi for the ascent of the Nevado de Toluca; and by 2 p. m. had reached the limit of vegetation at 13,000 feet elevation. After fortifying ourselves with lunch for the effort, a real one in the thin, chill air of this altitude, the base of these crags was explored, our search yielding even here a succulent, apparently a dwarf form of *Altamiranoa mexicana*. Returning through open pinewoods quite northern in aspect, a likely-looking cliff was investigated on the way, and found to be the real home of *E. byrnesii*. The plants pictured in photo B 5 were here growing in half shade, revelling in a damp moss-cushion, and must be exposed to frequent frosts and even snowfall at this elevation of at least 12,000 feet, which makes the species a true alpine.

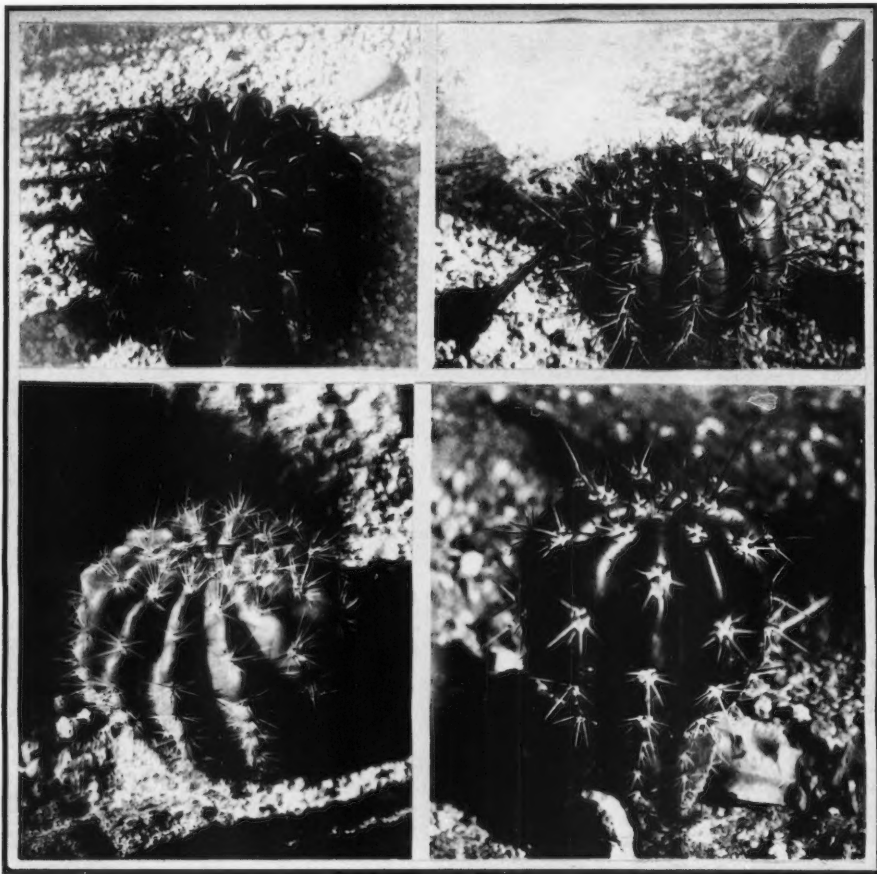
A very similar climate, as regards temperature and moisture, we found near Pachuca, where another excursion was made early in our travels. The vicinity is supposed to be the type-locality of several species of *Echeveria*, including *E. secunda* Booth. What

appears to be this species we found within an hours drive from Pachuca, near a hamlet named Puebla Nuevo. There it inhabits the northerly slopes of steep, volcanic crags, in halfshade cast by firs (*Abies religiosa*), pines, oaks, alders, madrone's, etc. Photo A8 shows one of these *Echeveria*-cliffs, and A5 one of our volunteer-collectors with an armful of *Echeverias*. This general locality is a most interesting one for the succulent-fan, for the ground is carpeted with a moss-like growth of *Sedum moranense*. *Sedum confusum* also frequently occurs here, sometimes lining the edges of streams and waterfalls. No locality was known to L. Praeger for this species when he wrote his study of the genus *Sedum*. A general view of the scenic beauties of this part of Hidalgo is pictured in photo D4 and shows the woods in which we found *Sedum diversifolium* Rose, growing on shaded, moist banks of moss, its drooping shoots of pale leaves looking for all the world like a maidenhair fern.

This day ended in pouring rain and hail, but the next dawned fine again. Early in the morning, even before breakfast, we discovered *Echeveria elegans* growing in one of the squares of the town, planted in the design of a turtle. The type-locality of the species is stated to be "Mountains above Pachuca," but we saw nothing more of this anywhere near the town, and this park may well have been the type-locality. This day we were bound for San Antonio Regla, by way of Real del Monte, and it would have been rather barren of results except for the stop made at Omitlan. We had the day before heard rumors of a wonderful fence of "conchas," as the small-rosetted *Echeverias* are known here, and after some inquiries arrived at the farmstead in question. The fence, so called, is a wall over 100 feet in length, covered solidly with a dense mass of *E. elegans*, in most luxuriant health, the individual rosettes attaining a diameter of over 4 inches (see photo A6). Clothing the background of one of the neatest farmyards seen in Mexico, the plants made a picture not soon forgotten. The lady of the farmhouse told us that these plants had been growing thus in her family for over 80 years; she wished to sell them in the U. S. A. and was disappointed to hear of the difficulties. From her we also learned of the real home of the species, stated to be the "Penas de Jacal," at least 150 miles distant from Pachuca, and shown in our photo A4. Unfortunately time was lacking for a visit to the exact locality.



- D. 1. Foothills of Popocatepetl, home of *Thompsonella*.
 2. *Thompsonella minutiflora* Rose, in full flower. (app. x 0.3)
 3. Lava-ledges near Eslava, topped by *Sedum oxypetalum* HBK.
 4. Moist woods northeast of Pachuca, home of *Sedum confusum* Hemsl.
 5. *Sedum diversifolium* Rose, in the same woods.
 6. *Altamiranoa mexicana* (Schlecht.) Rose, at Cima.



UPPER LEFT: *Echinopsis ancistrophora* Spegazzini. RIGHT: Probably *Echinopsis kratokhviliana* but closely resembling *E. umidiave* and *Lobivia graulichii*. LOWER LEFT: *Echinopsis calochlora* Schumann. RIGHT: *Echinopsis huottii* Cels.

Echinopsis

By E. C. HUMMEL

Since greater interest has been shown in collecting cacti and succulents, a larger market has opened itself, not only to legitimate and honest nurserymen, who sell seed and plants that are as listed, but also to those whose main interest lies in the acquisition of the dollar and not in dispensing value in return. Being attracted to the many beautiful forms and flowers of *Echinopsis*, like many other amateurs specializing in this group, with only a small library for reference, I soon found I had acquired a marvelous collection of synonyms and hybrids.

Upon analysis I find many reasons; it being a genus that hybridizes freely, a plant of *Echinopsis multiplex* may flower at one end of the greenhouse, while a plant of *E. eyriesii* may be in bloom at the opposite end, all that is necessary to cross pollinate these two plants is a moth, humming bird, bee, ant, earwig, etc., looking for food. The resulting seed if not destroyed, finds its way into the trade, as seed of valid species. If planted and given reasonable care, heterosis or the vigour of hybrids being a well established fact, the result will naturally be disappoint-

ing if a true species is desired.

In the past few years, foreign as well as local markets have listed seed of horticultural varieties, which anyone familiar with Mendel's law of heredity, can easily see would be impossible to perpetuate unless the variety has been purified. To accomplish this, it is necessary to select the desired type, and breed only this type plant through several generations, until the plants desired characteristics are fixed and the unwanted ones recessive. So far as I have been able to find, this has never been done with any horticultural variety of cacti and in the case of many of them, including the *Echinopsis*, it is unnecessary as vegetative propagation can be carried on by off shoots. In the same way select floral varieties of roses and choice fruit trees are propagated by grafting and budding without purification.

In many of the seedlings, considered as valid species, I find a wide range of variation, all of which I believe justifies considering such as of hybrid origin. As many species are held tentative I see no reason why the study of recapitulation would not clear the species involved, for instance if *E. oxygona* seed, (which Britton and Rose were reluctant to credit as a valid species) were sown and seedlings were all alike, this plant should be considered valid, but if any of the seedlings should show the slightest variation, not explainable as sports, then Mendel's law would classify it as a hybrid.

Assuming that seed was purchased as *E. aurea* and grown until the plant attained maturity, to find when flowering instead of a golden yellow flower, (the external appearance of *E. aurea* being a predominate characteristic and the color of the flower being recessive) a white one in its place, you would be much surprised, but this is a very likely thing to happen if every precaution is not taken to prevent hybridization. Where plants are to be perpetuated by seed, if it is desirable to know the parentage of hybrids, cross fertilization between plants of the same progeny must be resorted to. In cases where sterile species are encountered this itself is reason enough to class it a hybrid. Hybrid seedlings clearly show some variation noticeable at first, in the cotyledons, spines, markings, color, etc. In the second generation hybrids, predominate characteristics are enhanced as maturity advances. Where neither parent is recessive the progeny should be about twenty-five per cent like each parent and the remaining fifty per cent like first

generation hybrids.

I do not underestimate the beauty and value of many of these hybrids, and if sold as such to lovers of cacti, they would be very acceptable. But to collectors, especially one earnestly trying to complete a collection, the buying of a seedling of *E. rhodotricha*, only upon its maturity to find that perhaps there had been an *E. rhodotricha* among its many ancestors, is very discouraging.

These plants being so easy to hybridize has led me into many interesting experiments, one of them proving to me the close relationship between *Echinopsis* and *Chamaecereus*, which showed signs of pollen reception and mature fruits, the influence of fertilization. In crossing *E. ancistrophora* with *E. eyriesii* the shape of the fruit of the *E. ancistrophora*, which is ellipsoid, was transmitted to *E. eyriesii* which has globose fruit, the fruit with the *E. ancistrophora* and those of *E. eyriesii*, being on the plant at the same time, making it quite noticeable.

One plant with a beautiful pink flower, has a compensated anther, that is, the pollen bearing qualities of the plant are dormant and to compensate itself the plant replaces this organ with an apical curled elongation. This is an interesting subject itself and suggests a possibility of lending itself, in my quest for a double variety that would be as much in contrast with other *Echinopsis* of few perianth rows, as a single peony with a double one.

Synonyms are also more plentiful than species, each dealer seeming to have the same plant under a different name. Many of them do not have the information available or the time to work on each particular genus, to correct their mistakes. It seems here is the place some of the members could be of great assistance by specializing in a particular genus. Considering *Echinopsis*, *Trichocereus*, *Lobivia* and *Rebutia*, they are most apt to cause confusion. Schumann placed *Lobivia* and *Rebutia* both with *Echinopsis*. With *Trichocereus* and *Echinopsis*, Britton and Rose considered that while the plants were very closely related, there were sufficient differences, in plant structure, flowers and fruit for each to be a valid genus. The *Trichocereus* being mostly columnar plants, with very large, wide open, campanulate (nearly rotate) flowers with large ovary, a wide throat and thick tube, while the *Echinopsis* have narrow campanulate flowers, with narrow throat and tube, and small ovary. Both genera, however, have very hairy tubes.

and ovary. This difference in flower form is well illustrated in Volume II, Page 492 of the CACTUS AND SUCCULENT JOURNAL where *Trichocereus schickendantzii* is shown beside *Echinopsis multiplex*.

Backeberg and Werdermann, whose ideas are well known to most of us have done a great work on the South American cacti. In Backeberg's latest work, BULLETIN OF CACTUS RESEARCH, he has taken the best of the competent works, offered constructive criticism and used his observations, made in the fields, as the cement that will bind them together, as substantial stepping stones to a uniform, universal classified system of cactus nomenclature. He has also added a great many new and interesting species, that were unknown to Britton and Rose.

Contrary to common belief, *Echinopsis* has quite a range of forms, Britton and Rose list, *E. shafferi* and *E. forbesii*, as being over three feet high at maturity. Some that exceed eighteen inches are *E. formosa*, *E. rhodotricha*, *E. cordobensis* and *E. minuana*, and many other species reach approximately two feet in cultivation, if the off-sets are removed. One of the new species found on a late expedition to South America, is *E. violacea* an aristocrat in any collection. In the garden of Dr. Houghton at San Fernando it is entirely at home. Its unusual size, without blemish, is remarkable, considering that it was found in South America, as a mature plant of fifteen years or more, transplanted to the green house of Winters Nursery in Germany and then imported to our President Emeritus' gardens, where at the corner of his glass house, no visitor could fail to see and admire it.

In *E. aurea* and *E. kratochviliana* we have two very different forms, alike, in that they are diurnal, the flowers opening for about five hours during the day, sometimes not opening the second day. They differ entirely in form and flower. *E. kratochviliana* having a light cream flower one and one-half inches in length; *E. aurea* having a golden flower three inches long. There are many who believe on account of the flowering habit, and the length of the flower tube, that *E. aurea* should be placed elsewhere. A sub-genus of *Lobivia*, *Pseudo-echinopsis*, has been suggested by Spegazzini (South American authority) and Backeberg, segregating the yellow flowering *Echinopsis* and I believe this is entitled to support. If this should be done *E. kratochviliana* must also be taken from the genus *Echinopsis*. If Britton and Rose is followed, *E. spiniflora*, a number of

which I have noticed in local collections, and which was pictured in the CACTUS AND SUCCULENT JOURNAL Volume IV, page 247, is not of the *Echinopsis* genus, the flower tube being only one and one-half inches in length and borne from the crown of the plant. I believe this should be placed in *Lobivia*, the species being close to *L. grandis*, if not conspecific with it, differing in rib and spine formation but little, none at all in flower, excepting the color, which is ignored by many botanists as a factor in classification.

Most of the *Echinopsis* open at dusk or a little later and remain open one, two or three days, if satisfactory weather prevails. This gives one, not being home during the day, plenty of chance to study the flowers. However, with *Echinopsis* that are strictly day bloomers, if they fail to accommodate by blooming during the week end, I am usually successful in postponing the opening by placing a large flower pot over the whole plant and plugging the drainage hole with a cork. The plant seems to suffer no ill effects.

C. R. Orcutt's work AMERICAN PLANTS describes a number of *Echinopsis* which were cultivated in California, about 1900, many of these have since been reduced to synonyms. It is very interesting to find that in so short a time, not all the plants he mentions can be found in cultivation here at present.

My experience in placing rocks of high refractive capacity, in the garden, has shown the need of caution. The danger of the sun's rays being deflected by the surface, and being focused on plants, must be realized. If small brown or black spots appear on the body of the plant, a careful survey should be made to determine if this is the cause. Next, watering too late in the morning may cause it, as each drop of water present when the sun is hot may act as a burning glass.

If you suspect fungus as the cause, the plant should be isolated or removed from the garden until it is cured. In most *Echinopsis* the culture is not at all difficult, as they are quite hardy and like more than the usual amount of water considered sufficient for other cacti. In foggy coastal sections, filtered light is not necessary, although I believe it desirable to have lath protection, as most species, in their native environment are found protected by shrubs which break the direct rays of the sun.

H. Johnson at Hynes has, undoubtedly one of the most outstanding *Echinopsis* collections in juvenile form. For mature specimens one must visit many collections, for they are never numerous.

The following 8 pages are the fifth installment of "The Cactaceae" B. & R.

Echinocereus perbellus

R. E. CARYL

EDITORIAL NOTE:

As far as we have been able to ascertain, this is the first time that the range of distribution of *Echinocereus perbellus* has included any part of the state of Oklahoma. Despite its rarity, it unquestionably has a very wide occurrence as Dr. Caryl found it growing in northwestern Oklahoma.

Dr. Caryl, who is an associate at the School of Tropical Agriculture of the University of California, in his letter accompanying the article, says in part:

"On January 1, 1934, I was transferred to the Soil Erosion Service of the U. S. Department of Agriculture, located at Stillwater, Oklahoma. Opportunity was afforded me to do a good deal of travelling in connection with this work, and I did not miss the chance to study the native species of cacti in that state, nor to bring home a few of the rarest specimens when I was finally transferred back to California.

"As the Oklahoma species are seldom seen in gardens here, I thought that perhaps it might be of interest to have some of them discussed with particular emphasis as to their reactions to the California environment. *Echinocereus perbellus*, is from the picture of a plant now growing in my garden in Riverside."

C. L. C.

Echinocereus perbellus, as the translation of its name suggests, is a very beautiful species, which has flowered abundantly in Riverside, California, since the transplanting of some mature plants from their native home in northwestern Oklahoma.

The description of the species in Britton and Rose, Vol. III, p. 24, cites neither the type locality nor the distribution, except in the statement that the species was collected by Rose and Standley at Big Springs, Texas, February 23, 1910, and was also found to be in cultivation in Texas.

Until recently, very little has been known regarding the distribution or occurrence of the species in its natural habitat, and rarely has it found its way to the gardens of California.

On March 6, 1934, a large group of this species was found by the writer in Major County, 30 miles east of Woodward, Oklahoma. It was associated with *Echinocereus reichenbachii*, *E. baileyi* and *Coryphantha vivipara*. The four species were found near the valley of the Cimarron River, and were growing on a hillside of nearly pure gypsum and lime. The hill was hollow in places, and many caves were noted in the vicinity. Considerable quantities of pure gypsum crystals

lay upon the surface of the soil and were found close beside the plants of the four species.

Britton and Rose, in their description of *E. perbellus*, omitted a description of the stigma lobes. This character is the most reliable one for the identification of the species, and for distinguishing it from *E. baileyi* with which it is very closely related. The following short description includes characters omitted from the original:

Plant body short cylindric; dark yellow-green in color; style short and stout, 3 to 5 mm. in diameter; stigma lobes very conspicuous, deep dark green in color, 20 in number, 8-10 mm. long; seeds minute, dark brown to black.

Because environmental conditions in Riverside are decidedly different, the Riverside flowers of this species differ somewhat in color and size from the flowers found in Oklahoma. The blossoms here are reddish purple instead



The illustration shows a typical plant of *Echinocereus perbellus* as compared in size with a fifty-cent piece.

of purple; they average 9 cm. in length instead of 4 to 6, and 6.5 cm. in breadth. The form of the perianth segments has not been changed as the acuminate pointed, oblong to oblanceolate petals still follow the original description. The entire plant has grown approximately 3 cm. in height since June 1, 1934, the date of planting, although some of this growth occurred during the three-month period between digging and planting.

SUCCULENT LITERATURE

Six years ago there was practically nothing available in English on the succulents and only the Britton and Rose monograph, "The Cactaceae," on cacti; Volume I of "The Cactaceae," was published in 1919 and was practically sold out before the other three volumes were completed; these four volumes were originally priced at \$75 for the set and today one is indeed fortunate to obtain a set for three times the original price and no doubt the value will increase with each year. Britton and Rose are priceless books for reference and are the most complete books on cacti. No cactus library can be complete without this valuable work. Volume I has been reprinted in the Cactus Journal and is now available, an exact duplicate as the original volume except without color, and is priced at \$10; only 100 of these are available. The other volumes will appear in installment form in the CACTUS JOURNAL.

Besides the pleasure in the possession of a cactus library, the books have a definite value which increases each year. For instance, Volume I of the CACTUS JOURNAL is now selling at \$15 per volume (bound) and will soon advance to \$25. Blane's catalogue which was published about 1887 and which sold at 10c is now also valued at \$25.00. The scarcity of these books has established these prices.

The best seller in the cactus world today is "The Cactus Book" by Dr. A. D. Houghton. This pioneer work has continued its popularity with the amateur since its appearance four years ago. Dr. Forrest Shreve's contribution "The Cactus and Its Home" will live as a masterpiece for its accuracy and its original material. "Texas Cacti" was an excellent treatise on the cacti of that state and the edition was sold out within a year and already commands three times its original price.

"The Stapeliaceae" by Alain White and Boyd L. Sloane published in 1933 is the best illustrated book of all succulent literature. Their work in amassing the most complete collection of Asclepiads is well recorded in their book.

Although the value of many of these books cannot be measured in dollars, the selling price does show that there is a constant demand for the worthwhile books and the time to buy is soon after the edition is announced.

Books such as "The Study of Cacti" by Vera Higgins and "Arizona Cacti" are most valuable for their drawings, charts and explanations which help the amateur to understand the more scientific books.

Several books are promised for this year. England promises us a translation of "Die Sukkul-

enten." Our President of the Cactus and Succulent Society of America has completed his contribution "California Cactus" which is ready for distribution. Then will appear the companion book to "Succulents," Van Laren's "Cactus Book," with its English translation and the 150 natural color reproductions. Dr. A. D. Houghton is completing his succulent book after four years of work and this promises to be an all-inclusive treatise on the succulents other than cacti. The botanical world is waiting for Mr. Eric Walther's monograph on Echeveria which will be one of the most complete publications on any one genus of plants.

These few comments should encourage succulent enthusiasts to renew their interest in these plants since so much literature is now available to help in naming and studying them.

SCOTT HASELTON.

NONINFLAMMABLE FORESTS

**(Editorial Page Los Angeles Times)*

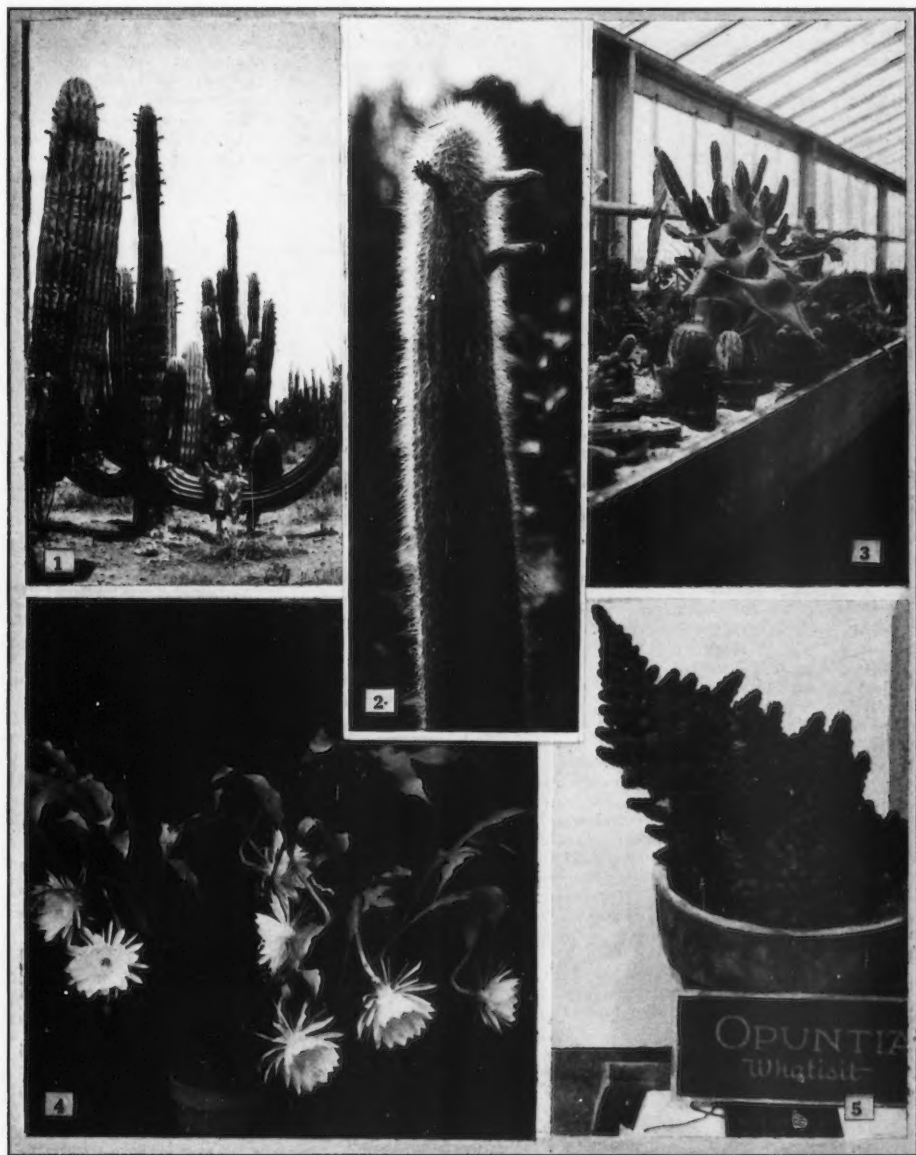
Tropical forests seldom suffer serious damage by fire. So dense, so full of moisture are the foliage and the vines—especially the vines—that they are as hard to ignite as a wad of wet blotting paper. If we could smother the slopes of our hills and mountains with bushy, low hanging trees and sap-filled vines of the tropical variety, we could make our western mountains as immune from fire hazard as the jungles of equatorial Africa. The question is, can we?

Dr. Arthur D. Houghton, taxonomic botanist of San Fernando, believes we can. On his three-acre ranch he has been experimenting with succulent plants and creepers of African origin which contain so much water that they are noninflammable. He has achieved considerable success in propagating these exotics on a small scale and believes they could be planted all over our mountainsides to form an effective covering in one season.

Every resident of California will wish the experimenter good luck in his efforts at forest salvage, though it will occur to many that small scale experimenting is a long way from many thousand square miles of application. These tropical vines and shrubs may respond to the care of an expert individual but will they survive when left to the tender mercies of a terrain and climate to which they are strangers?

Of course exotics do sometimes take kindly to untried conditions—witness the sprig of cactus from Western Texas, which transplanted as a keepsake on a farm in Northern Australia, now covers hundred of square miles and forms an impenetrable jungle. If Dr. Houghton's noninflammable creepers will do as well in our California mountains, we shall have little to fear in the future from forest fires.

**Editor's Note:* While reviewing thousands of plants in his research on his new book "Succulents" our President Emeritus should know the possibilities of succulents as firebreaks. The application of succulents is still new and the next few years may reveal many interesting developments.



(1) *Pachycereus pringlei* in Guaymas, Mexico. (2) *Cleistocactus baumannii* flowering in the garden of Kate Walker, Santa Barbara. The flowers are red, and only open at the tip. (3) *Stapelia gigantea* flowering in William Coburn's glass house at Daytona Beach, Florida. (4) *Epiphyllum oxypetalum*—Portland, Oregon. (5) A monstrose growth of a *Platyopuntia*. Every areole on the stem sprouts out a growth which repeats in turn until the very growth kills itself. This type of growth has not been successfully grafted nor rooted. Exhibited by Carl Brassfield at the Society's annual show last year.

QUESTION COLUMN

By WM. J. SUGANTY

I have never been able to find any data on how the evolution of the cacti was first determined. How was it decided that the *Pereskia* was the starting point and *Rhipsalis* the end?

The N. J. Experiment Station has done, I understand, a great deal of work with plants in pure sand, the various food elements being added. Very interesting facts concerning the effects of various elements upon the growth and flowering have developed. Has anything along this line been done with cacti and other succulents?

W. L.

A few facts regarding the origin of The Cactaceae from the *Pereskia* follow:

1. A vast majority of the species in the vegetable kingdom are mesophytic plants: that is, have leaves which wilt quickly when water is withdrawn; so, the probability or chance of a mesophytic ancestor is very large.

2. The *Pereskias* range from a wide leaved almost mesophytic form, such as *Pereskia pereskia*, by easy graduations through *Pereskopsis* to *Opuntia*; and eventually on to the *Cereanae* and other groups.

3. Study of the nascent spines seedlings of all genera, point to earlier ancestral forms leading back to the mesophytic ancestor.

4. Absence of fossil forms, seems to indicate that this evolution is recent—geologically. This is also indicated by the absence of missing links and the presence of many intermediate forms.

5. The drought hypothesis, that is, the idea that increasing aridity of the continent has been the actuating cause of this evolution, by permitting to survive only those variations which were best adapted by increasing succulence and further development of the spine system, may be true. The extension hypothesis may be the sole cause of this evolution or may run concurrently and synergically with the increasing aridity theory. This latter theory presumes that the ancestral mesophytic type was of littoral or perhaps riverine origin; that is, of a place where moisture and heat were abundant. Seeds carried by birds, or branches by the wool of animals, may have been transported to higher and more arid regions, where the fittest survived, and their increasingly succulent descendants again disseminated to still more arid regions.

6. To the latter part of your question let me say, *Rhipsalis* is not considered the end of evolution in this family; every species may be an end; as evolution spreads out, like the spokes of a wheel, from every living organism.

Question 2. Cultures of plants either in pure sand or distilled water, with the various chemicals added are being made in many Institutions; the work of Professor Gericke at the University of California at Berkeley, being original and outstanding.

The writer has been studying this question a long time with reference to Cacti and Succulents.

DR. A. D. HOUGHTON.

In your editorial note on page 91 Vol. VI of the JOURNAL you suggest that my *Rhipsalis* might be *cassutha* instead of *prismatica*. I looked up the description and find that my plant is neither

R. prismatica nor *cassutha*, but *R. cereuscula* with which it agrees in most every detail. The illustration in B. & R. is much the same as mine. The position (terminal) of the flowers, their size (15 mm), number of petals (9-12) and stigma lobes (3-4) all agree with the specimen. Also the number of short bristles in the areoles (2-4). The color of the petals is the only doubtful character as they are uniformly cream white with no suggestion of pink except in buds and so far with the first blossoms I have not seen any yellowish midrib. This slight variation in color is not important.

I have waited this long time for the blooms to appear. The buds first appeared on Jan. 15th. Today the first three blooms have expanded. There are many more to come and they persist for a long time. Slightly fragrant.

What can I do for an orange colored spot disease which appears on the tubercles of some of my cacti? Sun and dry air does not seem to check it. Is it fatal and does the red spider spread it?

B. H. C., Conn.

The question asked by Mr. B. Hartwell Clark as regards the orange colored spot disease found on some cacti, I have noticed this disease for a number of years, but as it never seems to become very prevalent and does not seem to particularly effect the general health of the plant, we have developed no control for it. However, I can readily understand that where a person has but a few specimen plants, it may cause quite a bit of disfigurement. The disease seems to be characterized by a rough darkened area surrounded by a slight margin of orange tissue. It seems to be found quite a bit on the *Coryphanthas*.

I would suggest that Mr. Clark paint the area with a weak Bordeaux mixture, repeating it two or three times in the course of a month; and as an additional suggestion, to make a weak water solution of Semisan, using it in the same way. It is just possible that this treatment would check the increase of the diseased area. It is possible that it is a physiological condition caused by some error in culture.

HARRY JOHNSON.

What kinds of cactus are adapted to inside culture and are there any that will thrive indoors without an abundance of sunlight?

L. S. R., St. Paul, Minn.

In my experience, the following species are very satisfactory for indoor planting. There are very likely many other good species for this sort of culture, but at present I would only recommend the following list. Plants inside should be kept fairly dry during the cold weather and they do not need an over abundance of water at any time. *Cereus beneckeii*, *Aporocactus flagelliformis*, *Chamaecereus silvestrii*, *Cephalocereus senilis*, *Coryphantha andreae*, *Ferocactus melocactiformis*, *Malacocarpus haselbergii*, *Notocactus cunninghausii*, *Malacocarpus mammulosus*, *Rebutia minuscula*, *Malacocarpus scopia*, *Ancistrocactus scheeri*, *Malacocarpus tabularis*, *Echinopsis grandiflora*, *Echinopsis aurea*, *Echinopsis formosa*, *Neomammillaria albicans*, *N. compressa*, *N. bocasana*, *N. celsiana*, *N. camptotricha*, *N. candida*, *N. candida var rosea*, *N. donatii*, *N. decipiens*, *N. elongata*, *N. stella aurata*, *N. elongata echinata*, *N. hahniana*.

N. haageana, *N. rhodantha ruber*, *N. rhodantha*, *N. pferfferi*, *N. longicoma*, *N. microhelix*, *N. polythele*, *N. praelii*, *N. parkinsonii*, *N. polygona*, *N. polyedra*, *N. pringlei*, *N. plumosa*, *N. densispina*, *N. spinosissima*, *N. solisii*, *N. trichantha*, *N. villifera*, *N. viereckii*, *N. wilcoxii*, *N. zephyranthoides* and *zeilmanniana*.

Give any of these plants ordinary window lighting or sky-lighting without sun and they will do very well. This group would make a collection that any cactus fancier would be proud to own.

WRIGHT M. PIERCE.

SUCCULENTS FROM SEED

(From New York Times)

By LAD CUTAK

Missouri Botanical Garden

Of all the plants that are now grown by amateur plant lovers, none are more ideal for the average home than cacti and the allied succulents from the dry and barren parts of the world. These interesting plants are becoming more and more popular with the general public, for they need a minimum of care and give much pleasure and satisfaction. Furthermore, the cultivation of cacti requires very little space in the home. A commendable collection can be grown in any ordinary window.

To obtain good-sized and healthy plants it is always best to get them from seed. The growing of succulents from seed in the home is not a difficult task. There are several reasons why growing from seed is to be encouraged. First, the succulent plants are found in all parts of the world, and because of this fact the importation of mature plants becomes a difficult matter. Rigid quarantine regulations and other Federal restrictions make it increasingly difficult to obtain many desirable plants.

Then, too, plants grown from infancy under favorable conditions in the home become hardier and less liable to loss than transplanted mature plants from the desert. A seedling acclimatizes itself, growing up to its environment, whereas collected plants find it hard to adjust themselves to a new home. For example, the Rainbow Cactus, when taken from its natural habitat, will not live long in collections.

Seeds of the more rare and exotic succulents, as well as of the commonest kinds, are now sold by many dealers. Care is exercised to obtain good seed from reliable concerns. Fresh seed is of the utmost importance, and no time should be lost in planting it. The germination of old seeds will be poor even under the best of conditions.

For a fine collection of cacti and other succulents, all the equipment that is necessary is a flower pot or two (preferably a seed pan), a saucer underneath to hold water, a small square of glass for a cover and a sunny window. For seed planting, the ordinary porous four-inch pot is very convenient. It is essential that the pot be clean, preferably a new one, as an old container is apt to hold life such as green algae, that later will prove detrimental to the young seedlings. An open, drainable soil composed of equal parts of garden loam, well decomposed leaf mold and sand, sifted through a fine sieve, is the best medium for growing cacti.

Care is taken to provide extra good drainage.

This can be assured by the generous use of broken pottery or gravel in the bottom of the seed pan. Upon that base the soil is sifted to within an inch of the top of the pot. The soil is pressed firmly and evenly, but not packed hard. Seeds of most succulents, as a rule, are very small, and they must be covered only as deep as the diameter of the seed itself. The larger seeds can be sown in rows, but fine seed is best scattered over the surface, with just a sifting of soil barely covering it.

Next a saucer (or any tin pan) filled with water is placed on the seed pan until the surface of the soil becomes moist. Finally, the soil is pressed down lightly and evenly, and a thin layer of fine gravel is scattered on top—this to support the germinated plants and help in retaining moisture. After planting, a glass cover is placed over the pan, which is set in a well-lighted window. Ventilation is given occasionally by removing the cover from the seed pan. The temperature best suited for quick germination should not vary much from 70 degrees Fahrenheit. At no time during the germination period is the seed pan permitted to dry out.

After some days, if the seed is fresh, tiny little seedlings will make their appearance, forcing their way through the gravel to the sunlight, and soon the entire surface of the soil will be covered with them. Seed germination varies with the different kinds. Some of the Carrion-flowers (*Stapelias*) and also the Figmarigolds (*Mesembryanthemums*) may germinate within thirty-six hours under perfect conditions, but the average is from a week to a fortnight. Some will take longer, but those not showing any signs in three to five months may as well be dumped.

After germination the glass cover is removed and the tiny seedlings are shielded from the direct rays of the sun. The soil is kept moist but not too wet. The application of water to the surface is not recommended unless a very fine, mistlike spray can be created. The best method is to set the pot or pots in a pan of water, letting them soak up from below. The length of time between waterings will vary, according to the conditions maintained around the plants as regards heat and ventilation. Under ordinary house conditions it will be necessary to water from below every four to seven days.

Early transplanting is not necessary unless the seedlings begin to crowd one another. The seedlings are transplanted into small flats or into larger seed pans, using about the same mixture of soil as for the seeds. It is a good plan to give the young plants considerable room and not crowd them after transplanting. The rows should be about an inch apart and the distance between the seedlings about the same. A window box of tiny, succulent seedlings is both decorative and fascinating.

The *Stapelias* undoubtedly are some of the most curious plants known, and because of their rapid growth from seed are recommended for the beginner. Some Carrion-flowers will bloom within two years of planting of the seed. The Old-man Cactus probably is the most popular and distinct of all the cacti and its seed likewise germinates readily. Even in its early stages this member becomes completely covered with long, silky hairs.



Grand Sweepstakes Winner 1934. Exhibit of Soldena Gardens which won the leading prize in the Sixth Annual Show of the Cactus and Succulent Society of America.

Seventh Annual Show

All efforts are being made by your show committee to make this exhibit, the Seventh Annual Show, the finest and best yet held by the Society. All indications show a steadily increasing interest on the part of exhibitors, with many new entrants who have never before exhibited. With the innovation of giving cash prizes as well as other trophies for the more important classes this year, the committee has stimulated interest especially in the larger displays. A great fight is expected for the prize of \$50 for Grand Sweepstakes, as well as the prizes of \$20 each for the Best General Collection of Cacti and the Best General Collection of Succulents in the open division.

Hundreds of new importations of rare, exotic plants have arrived for southland collectors in the past year and practically all of them will vie for the Rarest Cactus and Rarest Succulent in the show. Exhibitors are asked to designate plants so entered in this class, but the judges may consider plants not so entered, it being the wish of the show committee to see that the right plants win.

Entries may be made by non-members of the Society as well and to encourage these, Vice-President Howard O. Bullard is offering ten special prizes, each consisting of a year's membership in the Society and a year's subscription to the JOURNAL to be awarded to ten exhibitors, not hitherto members, whose entries receive most points. You are urged to encourage your friends who might otherwise not read this notice to compete. Entry forms may be secured by writing

Show Manager Robert W. Poindexter, 4160 Country Club Drive, Long Beach, Cal.

Exhibitors should bear in mind the following system of points which will guide the judges in making their selections whenever competition is very close.

Maturity and condition of plants	30 points
Number of species in a collection	30 points
Staging	15 points
Rarity	15 points
Correct labelling	10 points

Special consideration will be given to plants in flower.

It is planned to have someone from the committee present during the setting up of the displays to give help to those exhibitors requesting it, so that entries may be placed most advantageously to receive proper recognition.

The place: RUST NURSERY, 352 E. GLEN-ARM, PASADENA.

The time: MAY 9, 10, 11, 12. Open until 10 P. M. every day.

Admission: Adults 35 cents. Children 10 cents.

We'll see you at the show.

CLARENCE L. CLUM.

Notices of affiliated societies and other groups are solicited for this monthly column. Other items which would be of interest to our members, such as announcements of shows and exhibitions will be most welcome. Address all such communications to Clarence L. Clum, 2443 Echo Park Ave., Los Angeles, Calif.

IDENTIFICATION SERVICE

This service is offered by the Society to its members and to members of Affiliated Societies. The latter should forward correspondence in connection with identification through their respective secretaries.

The object of the service is to assist collectors by furnishing them names, wherever possible, for unnamed plants which they have in their collections. In order to do this it will usually be necessary to have specimens of the plants themselves, although in some cases it may be possible to make identifications from photographs or from accurate, detailed descriptions. Plants should be numbered when more than one is forwarded at a time. If their return is desired, they should be accompanied by return postage. In cases where flowers are necessary to complete identifications, the plants will be grown on for this purpose, unless immediate return is requested.

This service is in charge of Dr. R. W. Poindexter, 4160 Country Club Drive, Long Beach, California. Specialists in the various departments of the cactus and succulent field will be consulted and every effort will be made to make identifications as accurate as possible. The naming of new or undescribed species is not contemplated. There is no charge for this service.

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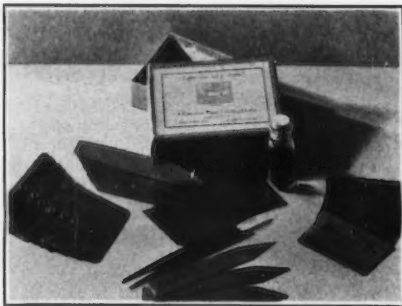
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